Paper No. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte TAISUKE HIROOKA and HIDETAKA SAKUMICHI

Appeal No. 2003-0907
Application No. 09/337,278

HEARD August 21, 2003

Before KIMLIN, JEFFREY T. SMITH and POTEATE, ***Administrative Patent Judges***.

JEFFREY T. SMITH, ***Administrative Patent Judge.***

DECISION ON APPEAL

Applicants appeal the decision of the Primary Examiner finally rejecting claims 1, 3, 5, 7, 9 and 10.[1,2] We have jurisdiction under 35 U.S.C. § 134.

[1] According to Appellants, claims 11 to 19 have been withdrawn from consideration. (Brief, p. 1).

[2] According to the Examiner, claim 8 has been canceled by Appellants in the response filed with the Brief. (Answer, p. 16).

CITED PRIOR ART

As evidence of unpatentability, the Examiner relies on the following references:

Chung et al. (Chung)	5,336,371	Aug. 9, 1994
Simmons et al. (Simmons)	5,693,148	Dec. 2, 1997
Kanno	5,873,380	Feb. 23, 1999
Miyashita et al. (Miyashita)	6,167,583	Jan. 2, 2001
Takehiko et al. (Takehiko) Japanese Patent Application	JP04-206724	Jul. 28, 1992

BACKGROUND

Appellants' invention relates to the method of cleaning an electronic component. The method includes using water containing CO_2 gas and having a resistivity value of less than 5 MΩ. (Brief, p. 2). Claim 1, which is representative of the claimed invention, appears below:

> 1. A cleaning method of an electronic component wherein an object to be cleaned is cleaned by bringing a sponge member into contact with the object to be cleaned while supplying, to said object to be cleaned, water containing carbon dioxide gas having a resistivity value of less than 5 MΩ.

The Examiner rejected claims 1 and 5 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita and Kanno; claims 1 and 5 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno and Takehiko; claims 3 and 7 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita and Kanno, as applied to claims 1 and 5, further combined with Simmons; claims 3 and 7 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno and Takehiko, as applied to claims 1 and 5, further combined with Simmons; claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno and Simmons, as applied to claims 1, 3, 5 and 7 further combined with Chung; claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno, Takehiko and Simmons, as applied to claims 1, 3, 5 and 7 further combined with Chung. (Answer pp. 5-10).

Appellants have indicated (Brief, p. 3) that, for each ground of rejection, the claims can be considered to stand or fall together with the exception of claims 9 and 10. We will consider the claims separately only to the extent that separate arguments are of record in this appeal. Any claim not specifically argued will stand or fall with its base claim. Note ***In re King***, 801 F.2d 1324, 1325, 231 USPQ 136,

137 (Fed. Cir. 1986); ***In re Sernaker***, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983).

Rather than reiterate the conflicting viewpoints advanced by the Examiner and the Appellants concerning the above-noted rejections, we refer to the Answer and the Briefs. For the reasons set forth below, we will sustain the Examiner's rejections.

DISCUSSION

Appellants in the specification, page 1, disclose that in conventional cleaning methods for electronic devices the object to be cleaned is wiped using a sponge while supplying water to the object. This method provides the object with a high degree of cleaning. Appellants have discovered that the object being cleaned is adversely charged with electricity due to the wiping with the sponge.

Miyashita discloses that semiconductor devices can be cleaned using pure water having a resistivity of about 5 MΩcm to 18 MΩcm from which impurities such as ions, fine particles, germs are removed. (Col. 1, ll. 22-25). Miyashita, like Appellants, recognize that wiping the semiconductor with a brush (sponge) material that came into contact with the device was known. (Col. 1, ll. 34-38). Miyashita acknowledges that in conventional cleaning the liquid is supplied to the outer

circumference of the roll brush. Miyashita further acknowledges that clogging of the roll brush results in counter contamination in subsequent cleaning. (Col. 1, ll. 56-60). One of the devices described by Miyashita employs sponge brushes that do not come into contact with the upper and lower surfaces of the device and a third brush that abuts the side portion of the device for cleaning. (Col. 2, ll. 11-38). The cleaning method of Miyashita uses sponge-like brushes and water having resistivity of about 5 MΩcm in the cleaning method. (Col. 3, ll. 36-43; col. 4, ll. 1-9; and col. 5, l. 60 to col. 6, l. 7).

The Examiner relies on Kanno to exhibit that persons of ordinary skill in the art recognize that the use of large amounts of water on the surface, of the device to be cleaned, would generate a static charge and this charge could be reduced by lowering the resistivity of cleaning water by the inclusion of CO_2 gas. (Answer, p. 5). Kanno specifically discloses "the resistivity of pure water may be lowered by mixing a gas, such as CO_2 or a surfactant with pure water in consideration of electrical damage (static charge) applied to a device." (Col. 5, ll. 37-40).

We agree with the Examiner's determination that Miyashita's resistivity of about 5 MΩcm overlaps the resistivity of claim 1 and renders the subject matter ***prima facie*** obvious.[3] (Answer, p. 6).

Appellants argue that the Examiner has not established a ***prima facie*** case of obviousness because the brushes of Miyashita do not touch the semiconductor device. (Brief, p. 5).

We are not persuaded by Appellants' argument. As discussed above, a person of ordinary skill in the art would have recognized the problems of electrical build-up on the semiconductor device by allowing the brushes to contact the device. A person of ordinary skill in the art would have also recognized the problem of

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[3] In cases involving overlapping ranges, the CAFC and CCPA have consistently held that even a slight overlap in range establishes a *prima facie* case of obviousness. ***E.g., In re Woodruff,*** 919 F.2d at 1578, 16 USPQ2d at 1936-37 (concluding that a claimed invention was rendered obvious by a prior art reference whose disclosed range ("about 1-5%" carbon monoxide) abutted the claimed range ("more than 5% to about 25%" carbon monoxide)); ***In re Malagari,*** 499 F.2d at 1303, 182 USPQ at 553 (concluding that a claimed invention was rendered *prima facie* obvious by a prior art reference whose disclosed range (0.020-0.035% carbon) overlapped the claimed range (0.030-0.070% carbon)); ***see also In re Geisler,*** 116 F.3d at 1469, 43 USPQ2d at 1365 (acknowledging that a claimed invention was rendered *prima facie* obvious by a prior art reference whose disclosed range (50-100 Angstroms) overlapped the claimed range (100-600 Angstroms)). The CAFC has also held that a *prima facie* case of obviousness exists when the claimed range and the prior art range do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. ***Titanium Metals Corp. v. Banner,*** 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985) (concluding that a claim directed to an alloy containing "0.8% nickel, 0.3% molybdenum, up to 0.1% maximum iron, balance titanium" would have been *prima facie* obvious in view of a reference disclosing alloys containing 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium).

using high resistivity water during cleaning. The prior art must be considered together with the knowledge of one of ordinary skill in the pertinent art. A reference need not explain every detail since it is speaking to those skilled in the art. ***In re Paulsen,*** 30 F.3d 1475, 31 USPQ2d 1671, 1675 (Fed. Cir. 1994).

We have carefully considered the evidence in the declaration, filed May 20, 2002, in light of the arguments in the brief. We must disagree with Appellants that the evidence establishes that the results of the showings are unexpected from the teachings of the cited references. The declaration compares the method of cleaning an alumina titanium carbide wafer using water with a resistivity ranging from 0.1 to 17 MΩ, adjusted with CO_2 gas. Appellants argue that Miyashita does not disclose the presence of CO_2 however, the showing of the declaration does not compare the adjustment of resistivity with other gases. ***See, e.g., In re Burckel,*** 592 F.2d 1175, 1179-80, 201 USPQ 67, 71 (CCPA 1979) (the claimed subject matter must be compared with the closest prior art in a manner which addresses the thrust of the rejection). As stated above, the method of Miyashita does not disclose what is done to the water to provide a resistivity of about 5 MΩcm. The Appellants have not provided a nexus between showing in the declaration and the invention of

Miyashita. It is well settled that the burden of establishing the practical significance of data in the record with respect to unexpected results rests with the Appellants, which burden is not carried by mere arguments of counsel. See generally ***In re Geisler***, 116 F.3d 1465, 1470, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997); ***In re Merck & Co.,*** 800 F.2d 1091, 1099, 231 USPQ 375, 381 (Fed. Cir. 1986); ***In re Longi,*** 759 F.2d 887, 897, 225 USPQ 645, 651-52 (Fed. Cir. 1985); ***In re Klosak,*** 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972). Thus, Appellants have not carried the burden of explaining the practical significance of the results with respect to the invention of Miyashita, *vis-a-vis* properties to be expected with a different compound to adjust the resistivity. Moreover, the declaration only provides tests on one type of wafer. However, the claims are open to cleaning a wide variety of devices. Thus, we find that the evidence presented in the declaration is not commensurate in scope with the range of compositions encompassed by the appealed claims. ***See In re Clemens,*** 622 F.2d 1029, 1035-36, 206 USPQ 289, 295-96 (CCPA 1980).

The Examiner's rejection of claims 1 and 5 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita and Kanno is affirmed. We also

affirm the rejection of claims 1 and 5 over the combination of Miyashita, Kanno and Takehiko. The Examiner cited Takehiko for a teaching that it was known to use CO_2 to adjust resistivity of water to a range of 0.1 to 3.0 MΩ. (Answer, p. 7).

The Examiner rejected claims 3 and 7 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita and Kanno, as applied to claims 1 and 5, further combined with Simmons; and claims 3 and 7 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno and Takehiko, as applied to claims 1 and 5, further combined with Simmons.

According to the Examiner, it would have been obvious to separate the sponge member from the semiconductor device for cleaning. Specifically, Simmons discloses that cleaning the brush/sponge causes contaminants to be repelled from the brush/sponge, thus reducing load-up and extending the life of the brush/sponge. (Answer, p. 8).

Appellants argue that the Simmons' process raises the pH of the brushes and does not suggest separating the object to be cleaned and that water is supplied to the separated sponge.

We are not persuaded by Appellants' arguments. We agree with the Examiner, Answer pages 16-17. A person of ordinary skill in the art would have recognized that when cleaning contaminants from a brush/sponge it should not be in contact with the device to be cleaned. Also a person of ordinary skill would have recognized that the water used to clean the device would have been suitable for rinsing the brush/sponge.

The Examiner rejected claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno and Simmons, as applied to claims 1, 3, 5 and 7 further combined with Chung; and claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno, Takehiko and Simmons, as applied to claims 1, 3, 5 and 7 further combined with Chung.[4]

The Examiner added Chung to the cited prior art to exhibit that soaking of a semiconductor device in water having a resistivity less than 10 MΩ prior to cleaning

[4] Claim 10 is a multiple dependant claim. We recognize that the subject matter of claim 10 does not further limit subject matter of claim 9. In the event of further prosecution, the Examiner should ensure that this dependancy is corrected.

was known and would have been obvious to a person of ordinary skill in the art. (Answer, p. 19).

As stated above, a person of ordinary skill in the art would have recognized that water having resistivity of about 5 MΩcm is used in removing contaminates from semiconductor devices. (See Miyashita, Kanno and Takehiko). In the cleaning method of Miyashita water is allowed to contact the device which is being cleaned. (Col. 5, ll. 33-37). Appellants have not specified any unique or unexpected results are achieved by soaking the device with the cleaning solution. A person of ordinary skill in the art would recognize that allowing the object to soak in the cleaning solution would not adversely affect the cleaning of the device.

Based on our consideration of the totality of the record before us, having evaluated the ***prima facie*** case of obviousness in view of Appellants' arguments and evidence, we conclude that the subject matter of claims 1, 3, 5, 7, 9 and 10 would have been obvious to a person of ordinary skill in the art from the combined teachings of the cited prior art. ***See In re Oetiker***, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

CONCLUSION

The rejection of claims 1 and 5 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita and Kanno; claims 1 and 5 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno and Takehiko; claims 3 and 7 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita and Kanno, as applied to claims 1 and 5, further combined with Simmons; claims 3 and 7 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno and Takehiko, as applied to claims 1 and 5, further combined with Simmons; claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno and Simmons, as applied to claims 1, 3, 5 and 7 further combined with Chung; claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over the combination of Miyashita, Kanno, Takehiko and Simmons, as applied to claims 1, 3, 5 and 7 further combined with Chung are affirmed.

Time for taking action

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

EDWARD C. KIMLIN
Administrative Patent Judge

JEFFREY T. SMITH
Administrative Patent Judge

LINDA R. POTEATE
Administrative Patent Judge

BOARD OF PATENT APPEALS AND INTERFERENCES

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